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10       **METHOD AND SYSTEM FOR DOWNLOADING, STORING AND  
DISPLAYING COUPON DATA USING THE HORIZONTAL  
OVERSCAN PORTION OF A VIDEO SIGNAL**

TECHNICAL FIELD

15       The present invention relates to data communication systems and, more particularly, relates to encoding coupon data in the horizontal overscan portion of a video signal and storing the data within an electronic coupon for subsequent redemption.

20       **BACKGROUND OF THE INVENTION**

Coupons have traditionally been printed on paper and distributed to targeted consumers. Manufacturers produce and distribute over \$380 billion worth of grocery coupons annually. In 1998, however, only about \$3.6 billion worth of coupons were redeemed. Obviously, consumers are  
25       receiving coupons that they do not wish to redeem. Research indicates that

most supermarket consumers find it very difficult to locate grocery coupons for all of the products that they purchase regularly. Thus, there is a need for a more efficient means for distributing coupons to consumers. If coupons can be more accurately targeted to consumers that are likely to redeem the coupons, then less money will be spent on printing and distributing coupons that are often thrown away.

Various attempts have been made to deliver coupons to a more directly targeted group of consumers. Some companies have made coupons available on the Internet, so that consumers can select coupons for printing and redeeming. However, this approach is only effective for reaching consumers who own a computer with Internet access and are willing to take the time to seek the coupons that they desire. Moreover, this approach is susceptible to fraud, because it is difficult to prevent consumers from printing and redeeming unlimited amounts of coupons for fraudulent purposes. In addition, the end result is still a paper coupon which must be handled and redeemed in the conventional manner, with resultant waste of paper and the burden of coupon sorting resting on the merchant.

Therefore, there is a need for a coupon distribution system that provides widespread coupon distribution, while permitting consumers to choose which coupons they receive.

## SUMMARY OF THE INVENTION

The present invention meets the needs described above by providing a method and system for downloading and redeeming coupon data that has been encoded in the horizontal overscan portion of a video signal. An

electronic coupon displays representations of coupons defined by coupon data that can be extracted from an encoded video signal that can be broadcast or played-back from video tape. The electronic coupon is equipped with a non-volatile memory that permits the coupon data to be stored for display  
5 subsequent to the transmission session (e.g., a televised program). The electronic coupon has a set-up mode which allows a user to pre-select types of coupons that the user would like to receive. Coupon data satisfying the user's selections will be stored in the electronic coupon, while coupon data not satisfying the user's selections will not be stored. A decoder extracts the  
10 coupon data from an encoded video signal and transmits the coupon data to the electronic coupon via a receiver of electronic contacts.

In one aspect of the invention, a system is provided for delivering and storing coupon data using the horizontal overscan portion of a video signal. The system includes a decoder that extracts coupon data from the horizontal  
15 overscan portion of a video signal during a transmission session, such as a television program or a video taped program. The system also includes an electronic coupon that can display a coupon representation defined by the coupon data. The electronic coupon has a non-volatile memory that receives the coupon data during the transmission session and stores the coupon data  
20 for display by the electronic coupon after the transmission session ends. The electronic coupon also has a controller that retrieves the coupon data from the non-volatile memory and causes the electronic coupon to display the coupon representation.

In another aspect of the invention, a method is provided for delivering  
25 and storing coupon data for an electronic coupon using the horizontal

overscan portion of a video signal. The video signal is received during a transmission session. The coupon data is extracted from the horizontal overscan portion of the video signal and a coupon representation defined by the coupon data is displayed after the transmission session ends.

5 That the invention improves over the drawbacks of the prior art and accomplishes these advantages will become apparent from the following detailed description of the exemplary embodiments and the appended drawings and claims.

## 10 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a graphical depiction of the primary components of a control system for delivering coupon data to an electronic coupon via the horizontal overscan portion of a video signal.

15 Fig. 2 is a block diagram illustrating the primary functional components of an exemplary electronic coupon.

Fig. 3 is a flow chart that illustrates an exemplary method for downloading and storing coupon data in an electronic coupon during a transmission session.

20 Fig. 4 is a flow chart that illustrates an exemplary method for redeeming coupons that are stored in an electronic coupon.

## DETAILED DESCRIPTION

25 An exemplary embodiment of the present invention is a system and method for decoding and storing coupon data received via the horizontal overscan portion of a video signal. A method and system for encoding data

into the horizontal overscan portion of a video signal is provided in a co-  
pending U.S. patent application, Serial No. 08/885,385, which is a  
continuation-in-part of U.S. patent application Serial No. 08,795,710. Both of  
these applications are assigned to the Assignee of the present application,  
5 Microsoft Corporation, and both applications are hereby incorporated by  
reference. For the purposes of the following discussion, it is assumed that  
coupon data has been encoded into the horizontal overscan portion of a video  
signal.

The present invention may be deployed in a wireless or hard-wired  
10 communication environment that includes an electronic coupon and a  
decoder that extracts coupon data from a video signal and provides the  
coupon data to the electronic coupon. The electronic coupon may include a  
controller and a Liquid Crystal Display (LCD) display. The controller  
receives coupon data from the decoder and produces an output to the LCD  
15 display, in accordance with the coupon data received from the decoder and in  
accordance with the coupon pre-selection choices made by the consumer.  
The controller also can store the received coupon data in a non-volatile  
memory that is also part of the electronic coupon.

Coupon data can be transmitted from the decoder to the controller by  
20 many well-known means of data transmission. In an exemplary embodiment,  
the decoder has a socket with exposed electronic contacts into which the  
electronic coupon can be placed. Corresponding electronic contacts of the  
electronic coupon can receive the coupon data from the electronic contacts of  
the decoder. The electronic contacts of the electronic coupon are referred to

as a receiver. The coupon data can be transmitted from the decoder to the receiver in discrete data words.

### An Exemplary Electronic Coupon Data Delivery System

5 Referring now to the drawings, in which like numerals represent like elements throughout the several figures, aspects of the present invention and exemplary operating environments will be described.

Fig. 1 is a graphical depiction of the primary components of a control system for delivering coupon data to an electronic coupon via the horizontal  
10 overscan portion of a video signal. The environment includes a control system **10** that provides coupon data to an electronic coupon **100**. An exemplary control system **10** includes a video signal source **102**, a decoder **104**, and a display device, such as television **106**. The control system **10** transmits coupon data to the electronic coupon **100** via decoder **104**. To  
15 accomplish this task, the decoder **104** interfaces with the video signal source **102** and the television **106** through a standard video interface. Over this standard video interface, the decoder **104** receives a video signal encoded with coupon data (encoded video) from the video signal source **102**. The decoder **104** extracts the coupon data from the encoded video signal and  
20 then transfers the coupon data to the electronic coupon **100**.

The control system may also have a video tape player **108**. The video tape player **108** can also provide coupon data that is stored on a video tape played by the video tape player. The video tape player **108** can transmit an encoded video signal to the decoder **104** over a video out line **110** that can  
25 be directly connected to the decoder. When the control system is configured

with a video tape player **108**, as depicted, coupon data may be provided from either the video signal source **102** or the video tape player **108**. This is advantageous, because it is desirable to provide coupon data both through televised programs (via the video signal source **102**) and through taped programs (via the video tape player **108**). When coupon data is provided via the video signal source **102**, the encoded video signal will simply pass through the video tape player **108**.

In either case, the video signal will be passed through the decoder **104** to the television **106**, which will present the encoded video signal in the conventional manner. Thus, a user can observe the video presentation of, for example, a tire commercial, on the television **106** while the decoder **104** transmits, to the electronic coupon **100**, coupon data relating to the commercial.

There is no need to modify the encoded video signal before passing it to the television **106**. Typically, the decoder **104** receives the encoded video signal, which is a standard video signal that has been modified to include digital information (i.e., coupon data) in the horizontal overscan intervals of the scan lines, which are not displayed on the television **106**. Thus, the television **106** can receive and display the encoded video signal without modification. The decoder **104** only needs to extract the coupon data from the encoded video signal and transmit the coupon data to the electronic coupon **100**.

## An Exemplary Electronic Coupon

FIG. 2 is a block diagram illustrating the primary functional components of an exemplary electronic coupon **200**. Generally, the electronic coupon has three modes. In set-up mode, a user can scroll through a menu of product and services descriptions and select the displayed products and/or services for which the user would like to receive coupons. In storage mode, the electronic coupon receives and stores coupon data extracted from the video signal that comports with the user's selections made in set-up mode. In redeem mode, the electronic coupon displays the coupons that are stored in memory and displays the Universal Product Code (UPC) bar code for coupons selected to be redeemed.

*clms. a1* In an exemplary embodiment of the electronic coupon, a products/services menu could be stored in either a non-volatile memory **204** or in a Read Only Memory component (not shown) of the controller. In either case, the user can enter set-up mode (or any other mode) by pressing the MODE key **212** until the LCD display **210** indicates that the set-up mode is selected. When the set-up mode is selected on the LCD display **210**, the user can press the SELECT key **214** to actually place the electronic coupon in set-up mode.

Once the electronic coupon is in set-up mode, then portions of the products/services menu can be displayed on the LCD display **210**. Each entry in an exemplary products/services menu has a checkbox next to it so that the user can indicate whether the electronic coupon should store coupons for a particular good or service. Preferably, the user could scroll through the entire products/services menu using scroll keys **214**, **216**. When the user



finds a product or service for which the user wants to receive and store a coupon, the user can indicate this by pressing the SELECT button **218** to mark the checkbox next to the product/service menu entry. Once the user has completed set-up mode, the electronic coupon will only store coupon data  
5 meeting the product/services selection requirements of the user.

In storage mode, the electronic coupon **200** receives coupon data in the form of data words from the decoder **208** by way of receiver **206**. The receiver **206** then passes the coupon data to the controller **202**. The controller **202** can either store the coupon data in memory **204** or can reject  
10 coupon data that does not meet the product/service selection requirements of the user. It will be appreciated by those skilled in the art that the non-volatile memory **204** could be implemented in the form of magnetic media (e.g., a storage disk), in the form of an electrical circuit (i.e., electronically), or by any other well-known means for storing data.

15 In an alternative embodiment, the decoder may be implemented as an integral part of the electronic coupon **200**. The period during which coupon data is received by the electronic coupon **200** (whether via a broadcast or via video tape play-back) is referred to as the transmission session. While coupon data could be delivered during any transmission session, it is contemplated  
20 that advertisers will prefer to transmit coupon data during an advertisement of the product/service to which the coupon relates.

When the user places the electronic coupon in redeem mode, an exemplary embodiment of the electronic coupon provides a brief description of each coupon in memory on the LCD display **210**. The user can scroll  
25 through the list of stored coupons using the scroll keys **214**, **216**. When the

user finds a coupon that the user wishes to redeem, the user can press the SELECT key **218** and the electronic coupon will display on the LCD display **210**, the UPC bar code for the selected coupon. Thus, the coupon can be read by a bar code scanner at, for example, a supermarket cash register.

5 In an exemplary embodiment, coupons may be deleted from the electronic coupon in redeem mode. This is advantageous, as the user may desire to remove a coupon from memory for various reasons. Because the memory capacity of the electronic coupon is finite, deleting coupons will be necessary at some point in order to save additional coupons. Additionally, it  
10 may be a requirement that a merchant delete a coupon that has been redeemed via an electronic coupon, in which case, the deletion of the coupon can be done by, for example, a supermarket cashier.

It will be appreciated that the LCD display **210** is merely an example of a means for redeeming a coupon stored in the electronic coupon **200**. Other  
15 devices, such as a readable/writable magnetic strip could be used for providing a representation of a coupon stored in memory.

### An Exemplary Method for Receiving and Storing Coupon Data

Fig. 3 is a flow chart that illustrates an exemplary method for receiving  
20 and storing coupon data during a transmission session. The method starts at step **300** and proceeds to step **302**, wherein the transmission session begins. The method then proceeds to step **304**, wherein the electronic coupon receives coupon data from the decoder. The method then proceeds to decision block **306**, wherein a determination is made as to whether the

received coupon data matches a coupon-type selection made by the user in set-up mode.

If the coupon data matches the user's coupon-type selections, then the method branches to step **308**, wherein the coupon data is stored in non-volatile memory. The method then proceeds to decision block **310**, wherein a determination is made as to whether the electronic coupon memory is full. If the memory is not full, then the method branches back to decision block **314**. If the memory is full, then the method branches to step **312**, wherein a Memory Full message is generated. The method then proceeds back to decision block **310** and a loop will be maintained until the user deletes one or more coupons from memory.

Returning now to decision block **306**, wherein a determination is made as to whether the received coupon data matches a coupon-type selection made by the user in set-up mode. If the coupon data does not match a coupon-type selection made by the user in set-up mode, then the method branches to decision block **314**, wherein a decision is made as to whether the transmission session is over. If the transmission session is over, then the method branches to step **316** and the method ends. On the other hand, if the transmission session is not over, then the method branches to step **304** and more coupon data can be received.

Returning now to decision block **310**, wherein a determination is made as to whether the memory is full. If the memory is not full, then the method branches to decision block **314**, wherein a decision is made as to whether the transmission session is over. If the transmission session is over, then the method branches to step **316** and the method ends. On the other hand, if the

transmission session is not over, then the method branches to step **304** and more coupon data can be received.

### An Exemplary Method for Redeeming Coupon Data

5        Fig. 4 is a flow chart that illustrates an exemplary method for redeeming coupons that are stored in an exemplary electronic coupon. The method starts at step **400** and proceeds to step **402** in which a redeem mode selection is received, indicating that the user intends to redeem at least one coupon. The method then proceeds to step **404**, wherein the description of  
10    the first coupon in memory is displayed. The method then proceeds to decision block **406**, wherein a determination is made as to whether a scroll key has been pressed. If a scroll key has been pressed, then the method branches to step **410**, wherein the description of the next previous or next subsequent coupon memory is displayed. The method then branches back to  
15    decision block **406**. If, at decision block **406**, a determination is made that no scroll key is pressed, then the method branches to step **408**, wherein a determination is made as to whether the SELECT key has been pressed. If the SELECT key has not been pressed, then the method branches back to step **404**.

20        If a determination is made that the SELECT key has been pressed, then the method branches to step **412**, wherein the UPC bar code is displayed that corresponds to the selected coupon. Preferably, the coupon will be redeemed at this point by, for example, a supermarket cashier, using a bar code reader. The method then branches to step **414**, wherein the method  
25    prompts the user for authority to delete the coupon. The method then

proceeds to decision block **418**, wherein a determination is made as to whether the user has requested the deletion of the coupon. If the user requests that the coupon be deleted, then the method branches to step **416** and the coupon is deleted from memory. The method then branches to step

5 **404**. If, on the other hand, the user does not request that the coupon be deleted, then the method branches from decision block **418** to step **404**.

The invention thus provides a method and system for decoding and storing encoded coupon data delivered via the horizontal overscan area of a video signal. An electronic coupon displays a UPC bar code corresponding

10 to coupon data that can be encoded into a video signal that can be broadcast or played-back from video tape. The electronic coupon is equipped with a non-volatile memory that permits the coupon data to be stored for subsequent redemption.

It should be understood that the foregoing relates only to specific

15 embodiments of the invention, and that numerous changes may be made therein without departing from the spirit and scope of the invention as defined by the following claims.